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AUTHOR Cahn, Lorynne D.
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ABSTRACT

Through the meaningful interpretation of sensory data and a background in language experiences, an individual can build more effective knowledge structures. With more effective knowledge structures, one can react more discriminatingly to the written and printed word. Sound knowledge structures involve not only the ability to organize and assimilate information but the ability to critically interpret the information as well. Of primary importance to the critical interpretation of the information received is the development of the critical reading skills of analysis, integration, and evaluation. Through the maturation of these reading skills, an individual can grow in the cognitive skills--hence problem solving ability--and finally, as a result, cope with the complex demands of society as a more intelligent human being. (Author)

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READING AND THE DEVELOPMENT OF INTELLIGENCE

A PAPER PRESENTED TO

THE FIFTH WORLD CONGRESS ON READING

VIENNA, AUSTRIA

SYMPOSIUM A--"THE PRINTED MEDIA AND THE READER"

Monday, August 12, 1974

Lorynne Cahn
Assistant Professor
Department of Education
Loyola University of the South
New Orleans, Louisiana

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Lorynne Cahn
Assistant Professor
Department of Education
Loyola University of the South
New Orleans, Louisiana

ABSTRACT

READING AND THE DEVELOPMENT OF INTELLIGENCE

Describes the knowledge structures an individual needs for higher levels of comprehension, the ability to problem solve, and ultimately, more intelligent behavior. Particularly noteworthy, as the necessary foundation for building better knowledge structures, is the development of perception and language. Through the meaningful interpretation of sensory data and a background in language experiences, an individual can build more effective knowledge structures. With more effective knowledge structures, one can react more discriminatingly to the written and printed word. Sound knowledge structures involve not only the ability to organize and assimilate information, but the ability to critically interpret the information as well. Of primary importance to the critical interpretation of the information received is the development of the critical reading skills of analysis, integration, and evaluation. Through the maturation of these reading skills, an individual can grow in the cognitive skills, hence problem solving ability; and finally, as a result, cope with the complex demands of society as a more intelligent human being.

Lorynne Cahn
Assistant Professor
Department of Education
Loyola University of the South
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INTRODUCTION

The health of a country depends in large measure upon the functional literacy of its citizens. Competency within one's community and in the nation implies that the citizens be well informed, have the ability to think clearly, and exercise critical judgments. For this purpose, among all the avenues of communication available, proficient reading is the most effective tool. It is universally agreed today that in order to lead a full and satisfying life, one must read with understanding. Efficiency in most activities of daily life depends, in large measure, upon accurate comprehension so that higher levels of learning, and more intelligent interaction among individuals, can take place.

Real learning and intelligent interaction involve more than the collection and assimilation of data; they

evidence the necessity for an individual to bring into play all the critical aspects of his reading and intellectual growth. The individual must have developed perceptually to be able to interpret meaningfully a variety of incoming information. He must have the proper background of language experience. An individual cannot function within the higher levels of comprehension without building the critical reading skills of analysis, integration, and evaluation. These skills need to be developed for the individual to become more capable of problem solving behavior and, in addition, to have the knowledge structures necessary to cope intelligently with the demands of everyday life.

In describing the relationship of reading to the development of intelligence, the first part of this paper will consider the knowledge structures an individual needs to cope with modern life. The role of these knowledge structures will be clarified by defining, and describing the relationships between, reading and intelligence. The paper will discuss the importance of the early acquisition of perceptual skills and a background of oral/aural language experience as prerequisites to better knowledge structures, reading growth, hence, intellectual development. Further, it will emphasize the importance of building critical reading skills to help individuals grow in the

ability to problem solve, and ultimately, to possess the necessary knowledge structures with which to face society as more intelligent human beings.

KNOWLEDGE STRUCTURES

Is knowledge merely an accumulation of data increased through curriculum content, or does it imply a continuing process of interpretation based upon effective communication and a background of perceptual and oral/aural language experiences? Knowledge is more than a body of content in the curriculum. To imply that sound knowledge structures involve mere content accepts a narrow, restrictive view. An individual requires knowledge structures, which involve not only the ability to organize and assimilate mere content, but, also those which give him the ability to critically interpret this content. An individual's knowledge structures must include the skills of analysis, integration, and evaluation, the ability to problem solve. They will involve, of necessity, the individual's linguistic competence, his perceptions, or, in essence, what skills he personally is able to utilize in building higher levels of learning.

To reach higher levels of learning involves self-directed change in the pupil's behavior as well as in the intellectual process. If an individual's knowledge

structures are to be effective, they must involve processes an individual may use to cope with change. The processes must offer opportunities to grow in cognitive skills: to develop higher levels of critical thinking and reading skills, to analyze, integrate, evaluate, problem solve; further, in the affective domain, to develop new insights, attitudes, and, finally, more intelligent behavior.

READING AND INTELLIGENCE: DEFINITIONS AND RELATIONSHIPS

Lohnes and Gray (11) conclude from their study on the relationship of reading to improving intelligence that growth increments in general intelligence are posited as the fundamental product of education. In the primary grades, beginning reading instruction teaches the mechanics of reading; as reading comprehension develops in subsequent grades, it relates more to the development of intelligence and intelligent behavior. Research findings generally suppose the idea that intelligent behavior will improve as the environment and way of learning improve. To understand the role reading plays in the effective use of knowledge structures, and hence, intelligence, it is important first to define reading and intelligence and note their relationships.

Reading

Reading, when broadly defined, is the meaningful reaction to the printed or written verbal symbols. A more specific definition of reading would include the active process of reconstructing meaning from language represented by graphic symbols, or, letters. The reader begins with the graphic symbols, and if he is successful, he ends with meaning, his interpretation of the author's message. For the reader to reach his goal of meaning involves the use of perceptual skills and language, interacting with the written or printed symbols in such a way that the reader can move from the code to the message. Perception and language are essential for this interaction to occur, and must be developed prior to higher levels of reading and, intelligent behavior.

Intelligence

The construct intelligence has been difficult to define; a general agreement has not yet been reached. Attempts to measure this elusive construct have met with a very limited degree of success. Piaget (13) never gives a static definition of intelligence; he gives a functional one. His two notions of intelligence are to understand the external world and to build or discover new structures within it.

Bloom (1964) was wise to speak of "stability and change in human development." Intelligence is developed in people over the span of many years and through the interaction of constitutional and environmental circumstances. Intelligence is the most noteworthy mental trait a child is developing in any school year (11).

It is not unusual for educators to oversimplify the definition of intelligence and conclude that it is whatever the I.Q. test measures. It is erroneous to believe that traditional tests of intelligence, that is, measurements of I.Q., can predict ability to read, or that they, alone, are measures of innate potential stripped of all its complications. Often one does not share the pool of common experiences upon which most tests of potential are based. "Intelligence tests do not discriminate between ignorance and stupidity" (4). The low test scores do not necessarily mean the inability to learn but the lack of opportunity to learn the information needed to do well on the test.

Relationship Between Reading and Intelligence

Published correlations between various measures of reading achievement and intelligence have run the gamut for magnitude. Virtually everything asked on an intelligence test requires responses which have been learned and for which varied perceptions, and experiential learning in language needed to take place. Since intelligence tests

primarily measure "developed ability" and learning aptitude, in some cases the same conditions that are causing reading problems may be depressing the intellectual quotient; some underlying environmental, cultural, emotional factor; a depressed experiential background in learning may be responsible both for low reading performance and ultimately, the low intelligence rating. For example, vocabulary plays a large role in determining a total intelligence score on an intelligence test. It is well known in America that children from non-English speaking homes and environments, in which there is little stimulation to explore, listen, talk, ask questions, and have their questions answered, are likely to have a limited vocabulary and will be considered retarded in perception, language development, reading, and ultimately, intellectual growth.

One cannot define reading and intelligence, and note their relationships, without observing the major points of emphasis regarding the areas of perception and language as related to reading achievement and ultimately, mental growth. Through the interpretation of incoming data, and through sufficient language development, increased meaning will be brought to one's world; thus, an individual will be able to react more effectively to the printed word and finally, to the complex demands of society.

PERCEPTION AND LANGUAGE: FOUNDATIONS FOR KNOWLEDGE STRUCTURES AS RELATED TO READING AND INTELLIGENCE

The efficacy of the knowledge structures utilized by an individual as he makes contact with, and reacts to, his environment, depends on his degree of perceptual and language development. The development of perception and language forms the backbone for reading and ultimately, intellectual growth.

Perception

Perception, the ability to interpret meaningfully through the senses, is the key to reading and is intrinsically woven into the construct, intelligence; a child learns through perceptual experiences. He learns about symbols, objects, and events that he encounters by using a combination of his senses and his brain.

When a child goes to school, he will hopefully possess a certain level of readiness made up of visual and auditory perceptual abilities which will enable him to learn to read, write, spell, speak and do arithmetic or anything else that involves the recognition, retention and recall of visual or aural symbols. These perceptual abilities are necessary to providing a background for reading growth, and, intellectual development. Because

one's perceptions of the world affect how he behaves, reading growth, and, ultimately, intelligence, may become a question of how varied and adequate is an individual's perception of the world. Similarities among individual experiences provide the common ground for the formation of mutual experiences and for broader perceptions to occur. These experiences play a major role not only in what the child perceives, in the manner in which he perceives, but in addition, they substantially affect the development of his thoughts and language.

Language

Man speaks and a resonant world responds. Language is the codification of centuries of human experience, transformed by man's creative intelligence and preserved from generation to generation by the means it itself supplies. Yet, the child cannot begin simply where the previous generation left off. The whole development must be recreated in him. "It is this legacy of language and man's capacity as heir which set him apart from all other animals" (16).

Among the esteemed investigators of children's thinking in this century are Lee Semenovich Vygotsky (19), A. R. Luria, and F. la Yudovich (12). For Vygotsky, environmental language is crucial to the early development

of thinking. The initial influence of adult language is of paramount importance. Vygotsky cautions teachers to be aware of the influence of their language and their structural concepts upon the student's learning.

A. R. Luria and F. la Yudovich, similar to Vygotsky, embrace a position involving a concept of "dialogue" in which the early stages of language development of children and the language of the adult, particularly the mother and later, the teacher, are brought into interplay at every stage of the development of language; they influence the child's perceptions of the world, and constitute the most important basis in the formation of the child's ability to form concepts, think, read, and grow intellectually.

If one adopts the views of these Soviet psychologists, one can concur that oral/aural language, as well as perception, in included in the process of an individual's development from the first months of his life and continues throughout his schooling. And, more importantly, this whole process of the transmission of knowledge through dialogue and the formation of concepts is the basic way the adult, and/or the teacher, influence the child, and constitute a major role in reading, and, intellectual development. As an individual increases his perceptions of the world and gains in linguistic competence, increased proficiency in reading, and problem solving ability can

take place; in turn, more discerning reactions to the external world can occur. With discriminating reactions to the external world, an individual is enabled to face the complexities of modern life as a more astute and intelligent human being.

READING AND THE DEVELOPMENT OF INTELLIGENT BEHAVIOR

Intelligent behavior, which includes the ability to think rationally, act purposefully, and adjust to one's environment, depends in great measure upon the individual's ability to problem solve. General strategies should be devised by the teacher for helping individuals bring problem solving techniques to the verbal and printed word so that they can communicate effectively and learn to deal efficiently with the academic, legal and technical information of today's complex society. Since reading is cognition, the growth of the critical reading skills of analysis, integration, and evaluation, is of paramount importance. Development of an individual's analytical, integrative, evaluative skills of critical thinking and reading ultimately leads to one with problem solving ability, to an individual whose communication process involves higher levels of comprehension, and, to one who can interact more competently with his environment.

Critical Reading Promotes Intelligent Behavior

For one to examine the communication process used in reading and comprehending, particular emphasis must be placed upon the interpretive process. This interpretive process accounts for the meaning which an individual derives from his abilities to think critically and has as its base the domains of cognition and affect. Within the cognitive domain, Bacon and Ruddel (Hodges, Richard E. and Hugh Rudorf, eds., Language and Learning to Read) (10) have devised a taxonomy of comprehension skills based upon evidence that directed instruction in these skills can enhance the critical thinking and reading skills. The cognitive skills include experience and memory, as well as the analytical, interpretive, and evaluative skills of critical thinking and reading. The affective domain includes those responses characterized as an individual's interest, attitude and valuing toward events and ideas.

The first, of Bacon and Ruddel's two major areas in cognition, emphasizes experience and memory, which include the skills of identification and recall, prerequisites for the assimilation of knowledge and experiential data. For the identification and recall experience, the student utilizes a variety of skills such as categorizing and classifying. Naming the main idea of a passage, noting the sequence of events, defining ideas and details, are

other essential features of the capacity for experiential recall. These skills supply many of the basic ingredients for critical thinking and critical reading.

Within the cognitive domain, the second area of emphasis involves critical thinking and critical reading. Only from developing the skills of critical thinking and reading, namely, analysis, integration, and lastly, evaluation, can higher levels of special reading comprehension abilities be built and can one move into problem solving behavior.

Analytical Skills

The analytical skills of critical reading involve examining the data of incoming facts, events, and ideas based upon one's conceptual framework and experiential background. As students progress through school and receive more information, they must be guided to question, separate fact from opinion, learn to recognize relevant from irrelevant information. The promotion of questions, answers, and group discussions, encourages the development of the analytical skills of critical reading, particularly with the aid of flexible teachers, who are good listeners, willing to question, and, in turn, be questioned. Additional analytical skills of critical reading are those involving the separation between the important and unimportant data, noting causal relations, noting details involving events and ideas, analyzing detailed legal data, and technical information.

Of primary importance among the analytical skills of critical reading are those in which students learn to separate fact from opinion in order to avoid becoming propaganda victims. With a visually oriented present day population, the mass media world of newspapers, magazines, television, and advertisements is a vital part of everyday life. One has only to glance at the headlines in the newspapers, look at the covers of many American paperback books, view ads and billboards, to know in an instant the mass media in America encourages people to react at the emotional level to the spoken and printed word. For students to interpret the printed media with more accuracy and ultimately function more effectively as problem solving, intelligent citizens, involves receiving training in the analytical reading skills from the elementary grades through high school, and in some instances, college.

A College Reading Program to Analyze Legal, Technical Information, and the Media

Xavier University, New Orleans, Louisiana, planned a reading program to help a group of low aptitude college students improve in analytical reading skills in order to react intelligently to legal, technical information, and the media. It was determined the real world of day to day living for the students necessitated a more pragmatic application of their critical reading skills. Through practical reading, the program concentrated on building the analytical skills of critical reading for the students involved in the program.

A multiplicity of materials was utilized: newspapers (National Observer, and daily newspapers); appliance warranties, credit applications, bank loans, automobile loan applications, and insurance policies. The emphasis on reading this material was to help students decipher the intricate legal and technical words on these forms. Examples of forms for filling out bank loans, checks, deposit slips, as well as savings withdrawal forms, were brought to class to be discussed and examined by the students. Samples of credit applications, and a variety of appliance warranty forms were investigated in class. Actual insurance policies were studied and analyzed. Emphasis was placed upon noting the details on loan agreements. The legal implications of automobile sales contracts were stressed since this was a major interest of the students in the class.

Billboards were photographed and the pictures were studied so that students could develop techniques for analyzing fallacious reasoning in advertising. With advertisements, the subtle and frequently fallacious reasoning involved in selling a product was examined. A multitude of magazine ads was utilized for the purpose of investigating the loaded word and shifty word fallacies as well as the false authority, false analogy concepts. Daily newspaper articles, current paperbacks, and magazines were used to examine differences between factual information, biased reporting, and opinion of the author.

The students completed the program as more enlightened consumers. The practice afforded them in analyzing legal and technical information was a step toward building their skills of critical thinking, critical reading, and problem solving. The Xavier students left the program with more discriminating reading skills, less subject to becoming citizens victimized by propaganda and the media.

"The chief job of reading education in an age of media fallout is not to train people to read novels in front of a fire, attractive as such a prospect might be, but to make them critical readers in a world where emotional reading at the wrong time can amount to joining the mob rather than resisting it, and will in the long run enslave a man rather than set him free" (3).

Integrative Skills

In addition to the analytic skills of critical reading, the integrative skills become important in order to explain the data one has gathered and to summarize that data. Providing examples and illustrations offers students assistance in explaining different types of subject matter. Inviting comparisons and relationships between various factors, summarizing information, organizing facts, events and ideas, provides additional skills with which to help students grow in the integrative skills of critical reading. Like the analytical skills, the integrative skills extend into the problem solving domain. Through combining information, new ideas can be generated and hypotheses can be formulated for solutions to the problem.

Evaluative Skills

Lastly, are the evaluative skills of critical reading which involve making judgments, first by appraising the validity of the facts, events, ideas, and purposes; next, by assessing the competency of the writer or speaker. The evaluative skills involve devising criteria and standards and providing students with numerous encounters with ideas, events, and facts so that students can rate a work or idea according to standards in that field. Instruction in the use of these critical thinking skills at the complex level

of evaluation, can be guided effectively from the elementary school throughout a student's academic career. Evaluative skills, like the skills of analysis and integration, play an essential and vital role in problem solving. Just as ideas, events, and facts of other authors should be assessed for competency, validity, and reliability, so should these evaluative skills be applied to the newly created ideas and solutions of the problem solvers.

The cognitive domain of Bacon and Ruddel explicates the analytical, integrative, and evaluative skills of critical reading; with higher levels of critical reading, and problem solving behavior, the importance of the affective domain lies in the resultant interests, attitudes, and values on the learner and thus plays an important role in his thinking process and ultimately, intelligent interaction.

CONCLUSION

Intelligent interaction among men requires proficient reading. In many situations, more discriminating levels of reading comprehension constitute man's indispensible channel of communication with an ever widening world. To think that an individual can achieve success along any line without the ability to read critically transcends rational judgment today.

An individual requires knowledge structures which involve not only the ability to organize and assimilate

information but those which enable him to critically interpret this information as well. An individual's knowledge structures must include the skills of analysis, integration, evaluation, the ability to problem solve, for him, in the final analysis, to interact more intelligently among men.

Reading plays a vital role in the development and effective use of knowledge structures. First, the efficacy of the knowledge structures utilized by an individual, as he makes contact and reacts to his environment, depends upon his degree of perceptual and language development. Perceptual and language development, in turn, lay a foundation for reading growth and higher levels of reading comprehension. Critical reading, then, lays a foundation for problem solving ability, and ultimately, more intelligent behavior. As an individual grows in the ability to bring problem solving techniques to the printed and written word, he will communicate and deal more effectively with his environment; finally, as a result, react more intelligently to the complexities of society and to the world in which proficient reading is man's most indispensable tool.

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